Executive Summary

Details on the Bullets Below are found in the Individual Subgoal Sections for the 2002, 2004 and 2006 LaMP Reports

Goal: To Restore and protect the integrity of the Lake Michigan ecosystem through collaborative place-based partnerships.

Strategic Action Agenda	Subgoals of the Lake Michigan LaMP	Significant Happenings 2000-2006	Next Steps	Long-Term Objectives
	END POINT SUBGOALS			
Human Health Actions that prevent human exposure to pollutants in the ecosystem and prevent or minimize sources SOLEC Indicator Bundles •Human Health •Coastal Zone •Contamination •Land Use/Land Cover	**Subgoal 1** We can all eat any fish ***Status*** • Mixed in 2006 • Mixed/Improving by 2010 • Sustainable by 2020 **Subgoal 2** We can drink the water ***Status*** • Sustainable in 2006 • Sustainable in 2010 • Sustainable in 2020 **Subgoal 3** We can swim in the water ***Status*** • Mixed in 2006 • Mixed/Improving by 2010 • Sustainable by 2020	**2002** • Fish advisories for mercury by USFDA and for dioxin by Michigan and Tribes • Grand Cal and Fox River AOC sediment cleanup plans underway • Sokaogon Chippewa Community Bans Burn Barrels • Grand Traverse Band of Ottawa and Chippewa Indians ban burning trash/garbage on tribal lands • TMDL workshops with regulators and stakeholders held • Mercury Phase-Out proposal proposed • Drinking water monitoring and reporting information available on the web • Great Lakes Beach Conference held • Beaches Environmental Assessment and Coastal Health Act of 2000 • EPA and FDA issue joint mercury fish advisory **2004** • Legacy Act 2002 to clean up sediments passed and $10 million appropriated for FY 2004, $46 million proposed for FY 2005 • Fish consumption advisory outreach programs developed for non-English speakers • Impaired waters strategy under development • Source water assessment programs almost completed • Public Health Security and Bioterrorism Preparedness and Response Act of 2002 being implemented • Drinking water education programs developed • Defense Department Developing Rapid Water Quality Testing Technology • Constructed wetland effectiveness researched • Chicago and Milwaukee to control CSOs • Cladophora alga resurges **2006** • **Great Lakes Fish Monitoring Program Continues** • **Illinois Proposes 90 Percent Mercury Emissions Reduction** • **USEPA Issues New Mercury Rules** • **Source Water Assessment and Protection Program – States Complete All Assessments** • **Water Security Plan Required** • **Pharmaceuticals, Hormones and Other Organic Wastewater Contaminants in U.S. Streams More Identifiable** • **NEEAR Water Study Helps Set New Beach Alert Standards** • **Cladophora Alga Continues to Grow** • **Lake Michigan CSOs Studied** • **Michigan to Clean up Galien River** • **Policy on Peak Wet Weather Discharges from Municipal Sewage treatment Facilities Proposed**	• Develop the Impaired Waters Strategy • Clarify common definition of "open waters" • Cleanup of superfund sites and other PCB contaminated harbors • Support efforts to recycle mercury-containing electronic devices • Continue Watershed Academy • Seek funding to develop a source water protection GIS system. • Enhance local public water supply security • Identify resources for public water suppliers to ensure that by 2011, 80% of the community water systems will be substantially implementing source water protection plans • Help coordinate outreach materials development • Continue support of Great Lakes Beach Association conferences • Report on the latest beach research • Report on research on beach grooming, pathogen tests, and cladophora bloom causes in the LaMP at the State of Lake Michigan Conference	• By 2020, beach, nonpoint source, CSO, CAFO management actions completed so that 90% of monitored high priority beach waters meet bacteria standards 95% of the average swimming season. • By 2011, 80% of the community water systems will be substantially implementing source water protection plans

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	END POINT SUBGOALS			
Restoration and Protection Actions that restore, enhance, and sustain the health, biodiversity, and productivity of the ecosystem SOLEC Indicator Bundles •Biotic Communities •Coastal Zone •Aquatic Habitats •Invasive Species •Land use/Land Cover •Resource Utilization •Climate Change	**Subgoal 4** All habitats are healthy, naturally diverse, and sufficient to sustain viable biological communities ***Status*** • Mixed in 2004 • Mixed/Improving by 2010 • Sustainable by 2020	**2002** • Perch population still dropping • Northwest Indiana Advanced Identification of Wetlands Study underway • Keystone species (diporeia) in Lake Michigan food web vanishing • Supreme Court Ruling narrows wetland regulation • Wisconsin passes wetlands protection law • Piping Plover critical habitat designated by USFWS • *Antrim County, Michigan Wetland Protection ordinance rescinded* • Wolf populations recovering • Habitat and Land Use Management Tool Box under development • Established a 1994 baseline for land cover • NIPC "Biodiversity Recovery Plan" document produced • Northwest Indian greenway plan unveiled • Sturgeon restoration efforts begin **2004** • Diporeia density continues to decrease • Dam removals in southeastern Wisconsin improve fish habitat • Nature Conservancy develops Biodiversity Blueprint • Chicago signs migratory bird treaty • Bald eagles return to Little Calumet River • Manistee Watershed grant • Wisconsin non-point source regulation promulgated **2006** • **Little River Ban Release Sturgeon Fingerlings** • **Boardman River Dams settlement Executed** • **Perch Young of the Year larger in number** • **Michigan and Other States Set Wetland Restoration goals** • **USFWS Awards grant to restore Hegewisch Marsh** • **Piping Plover agreement in place** • **Wisconsin DNR works to protect dwarf lake iris** • **Diporeia density continues to decrease** • **Wolves thriving, delisting proposed** • **Chicago Wilderness Report Card released (www.chicagowilderness.org)**	• Develop process to refine targets through public discussion and promote work toward targets • Continue to support components of lake basin biodiversity plan though watershed academy grants • Identify species sensitive to ground and surface water interaction • Provide GIS tools and land use models in workshops to promote knowledge of and protection of key habitat areas and trends in loss and gain • Promote the construction of new stream buffers and wetlands using, federal, state, local, and private resources and monitor loss and gain trends • Promote dam removal studies	• By 2020, 125,000 net acres of wetlands restored and subsequently protected • Dam removal and/or stream buffers lead to restored fisheries in 10 streams • By 2020, 1/3 of watersheds will be unimpaired, 1/3 have reduced impairments, and 1/3 have work underway.

Strategic Action Agenda	Subgoals of the Lake Michigan LaMP	Significant Happenings 2000-2006	Next Steps	Long-Term Objectives

Sustainable Use
 	
Actions that concurrently sustain the health of the environment, the economy, and the communities of the ecosystem
 	
SOLEC Indicator Bundles
•Contamination
•Biotic Communities
•Invasive Species
•Coastal Zones
•Aquatic Habitats
•Human Health
•Land Use/Land Cover
•Resource Utilization
•Climate Change
	Subgoal 5
	Public access to open space, shoreline, and natural areas is abundant and provides enhanced opportunities for human interaction with the Lake Michigan ecosystem
	
	Status
	• Mixed in 2004
	• Mixed/Improving by 2010
	• Sustainable by 2020
	
	Subgoal 6
	Land use, recreation, and economic activities are sustainable and support a healthy ecosystem
	
	Status
	• Mixed in 2004
	• Mixed/Improving by 2010
	• Sustainable by 2020
		2002
		• Governors and Premiers sign Great Lakes Charter Annex 2001
		• Indiana moves into Coastal Zone Management program
		• Wisconsin Smart Growth act
		• Historic Agreement to Manage Fisheries in 1836 Treaty Waters
		• Economic valuation studies by Northeast-Midwest Institute, Lake Michigan Federation, and University of Wisconsin Sea Grant
		• Lake Michigan Potential Damages study continues in sixth year
		• USGS Lake Michigan Trends Project funded
		• USGS Pollutants of Concern list developed
		• Upland Michigan Land Use report
		• Federal two-year ban on drilling under the Great Lakes continued in 2003
		• Michigan moratorium on drilling under the Great Lakes
		• Dams removed in Milwaukee and Muskegon Rivers
		• Menominee tribe purchases proposed Crandon Mine site
		• Groundwater studies document unsustainable withdrawal
		• UIC study shows economic benefits of sediment clean ups
		2004
		• Crandon Mine site purchased by tribes
		• Northwest Indiana mayors join to remake Indiana lakeshore.
		• Lake Michigan water trail proposed
		• Chicago launches new water agenda.
		• Michigan governor outlines comprehensive water agenda.
		• MMSD creates river revitalization program using easement acquisition.
		• Chicago diversion deficit reduced faster than planned
		2006
		• **Marquette Plan to open Indiana shore**
		• **Marquette Plan Phase 1 honored by American Society of Landscape Architects**
		• **Lake Michigan Watershed Trail proposed and under development**
		• **Sleeping Bear Dunes Developing New General Plan**
		• **Great Lakes Governors and Premiers Sign Great Lakes Charter Annex Implementing Agreements**
		• **Michigan passes new water withdrawal law**
		• **Illinois Governor Orders new water supply study**
		• **Lake Michigan diversion "debt" likely repaid in 2004 water year**
		• **Michigan court decree on walkable beaches**
			• Partner with the growing coastal zone management programs in the Lake Michigan basin to ensure that the issue of public access to the lake is balanced with protection of the ecosystem
			• Support *cladophora* research
			• Support a green marina dialogue
			• Determine protection status of world's largest collection of fresh water sand dunes
			• Public involvement in preservation and stewardship of special natural areas with public access for sport and recreational activities should be fostered by the following:
			  • Broaden the dialogue with state and local government land-use planners and decision-makers to balance environmental and recreational needs
			  • Provide tools for local communities to understand the value of the resource from a lakewide perspective and develop long-term management programs
			  • Identify open space multi-use opportunities and tools for such things as flood retention parks, and open space with commuter bike trails, among others
			• Help develop Green Marina, Highway, and Golf Course programs
			• Promote studies that investigate the status of groundwater resources and their impact on water quality and aquatic habitat
			• Support studies to determine sustainable yields for Great Lakes water resources
				• Sustainable management of the basin by 2020:
				  • Slowed withdrawal rates from basin groundwater
				  • Lake level fluctuations based on natural fluctuations with no major anthropogenic factors

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Remediation and Pollution Prevention
 	
Actions that achieve substantial pollution reduction by remediating sites, controlling pathways, preventing or minimizing sources
 	
SOLEC Indicator Bundles
•Contamination
•Land Use/land Cover
•Invasive Species
	Subgoal 7
	Sediments, air, land, and water are not sources or pathways of contamination that affect the integrity of the ecosystem
	
	Status
	• Mixed in 2004
	• Mixed/Improving by 2010
	• Sustainable by 2020
	
	Subgoal 8
	Aquatic and terrestrial invasive species are prevented and controlled
	
	Status
	• Mixed in 2004, possible deterioration
	• Mixed/Improving by 2010
	• Sustainable by 2020
		2002
		• Lake Michigan Mass Balance (LMMB) findings published
		• PCB levels in lake trout achieving equilibrium
		• U.S. EPA Atrazine Reassessment initiated
		• IADN results consistent with LMMB findings
		• Bush administration announced climate change and "Clear Skies" initiatives
		• 1999 Toxic Air Emissions inventory released
		• U.S. EPA published Air Great Lakes Deposition (GLAD) Strategy
		• PCB/mercury Clean Sweep in Cook County, IL
		• Wisconsin mercury regulations
		• States act to control animal operations
		• New aquatic nuisance species found in Lake Michigan
		• Michigan Ballast Water Bill
		• St. Lawrence Seaway Corporation to incorporate ballast water practices
		• Chicago River invasive species dispersal barrier installed
		• ANS Task Force and Great Lakes Panel on ANS continue work to control ANS
		2004
		• Corps funding secured for building permanent Asian Carp barrier on Chicago River system
		• Wisconsin begins mandatory rural NPS program
		• Michigan and Indiana add animal operation to permits
		• Milwaukee Metropolitan Sewerage District adopts mercury dental program.
		• Michigan proposes new NPDES permit for CAFOs
		• National Aquatic Invasive Species Act of 2003 passed.
		2006
		• **Quagga Mussels Increasing in Number to Compete for Food with Native Mussels**
		• **Sound and Bubble Barrier Could Deter Asian Carp**
		• **PCB, Mercury and Nutrient findings from LMMB:**
		• **Forecasted PCB concentrations in lake trout may permit unlimited consumption as early as 2039 at Sturgeon Bay and 2044 at Saugatuck**
		  • **PCB trends indicate that concentrations are declining in all media**
		  • **Atmospheric deposition is the major current route of PCBs to the lake (from sources inside and outside the basin)**
		  • **Chicago urban area is a substantial atmospheric source of PCBs to Lake Michigan**
		  • **There is a dynamic interaction among water, sediments, and the atmosphere where large masses of PCBs from sediments cycle into and out of the lake via the atmosphere as vapor phase**
		  • **The current major source of mercury to the lake is from atmospheric deposition.**
		  • **Most Lake Michigan lake trout and coho salmon exceed the USEPA guidelines for unrestricted consumption.**
		  • **Modeling results suggest that a significant amount of the existing mercury settling out of water is being recycled back into the system.**
		  • **Lake Michigan phosphorus loads and concentrations are low and below GLWQA and IJC targets**
		  • **Tributaries are the major source of phosphorus to Lake Michigan**
		  • **Highest concentrations can be observed in selected nearshore zones near tributary mouths and in Green Bay**
		  • **There is no evidence of increasing loads or increasing concentrations in the open-water through 2002; forecasts indicate relatively stable phosphorus and chlorophyll-a concentrations into the future**
		• **Green Bay clean-up agreements announced**
			• Education and outreach on aquatic invasive species in order to accomplish
			• Ship and barge-mediated introductions and spread of AIS in the Great Lakes should be eliminated
			• Federal, state, and/or local governments must enact measures that ensure the region's canals and waterways are not a vector for AIS
			• Federal and state governments must take immediate steps to prevent the introduction and spread of AIS through the trade and potential release of live organisms
			• Establish a Great Lakes Aquatic Invasive Species Integrated Management Program to implement rapid response, control, and management programs and assess the effectiveness of those programs
			• Develop a better understanding of the natural dynamics that affect pollutant distribution in the Lake Michigan ecosystem and why near shore and open lake can have wide variances
			• Reduce pollutant loads with effective control and pollution control measures
			• Build on the coordinated monitoring of 2005 and develop a 10-year trend analysis based on the 1994-95 mass balance project
			• Review contaminated sediment sites and their status will be updated for Legacy Act funding or delisting opportunities
			• Investigate nutrient contributions from the agricultural sector and non point sources during wet weather. Determine if nutrient levels are linked to *Cladophora* blooms
			• Hold meetings to discuss Lake Michigan Mass Balance models and implications for Impaired Waters Strategy
			• Develop Impaired Waters Strategy through basinwide meeting
				• By 2010, remediation of 50 percent of AOC sites
				• By 2020, remediation of 70 percent of AOC sites
				• By 2025, remediation of 100 percent of AOC sites
				• By 2010, vessels entering the Great Lakes will discharge ballast water free of invasive species.
				• Eliminate further ANS introductions by 2010.
				• Lake Michigan remains "Asian carp free"
				• By 2020 some, but not all fish will be safe to eat
				• By 2020, nearshore communities will have green harbors

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	END POINT SUBGOALS			
Information Sharing, Collaboration and Stewardship Actions that provide data access and exchange, facilitate involvement, and build capacity SOLEC Indicator Bundles •Contamination •Biotic Communities •Invasive Species •Coastal Zones •Aquatic Habitats •Human Health •Land Use/Land Cover •Resource Utilization •Climate Change	**Subgoal 9** Ecosystem stewardship activities are common and undertaken by public and private organizations in communities around the basin ***Status*** • Mixed in 2004 • Mixed/Improving by 2010 • Sustainable by 2020 **Subgoal 10** Collaborative ecosystem management is the basis for decision-making in the Lake Michigan basin ***Status*** • Mixed in 2004 • Mixed/Improving by 2010 • Sustainable by 2020	**2002** • Lake Michigan Forum developing Stewardship trust • State of Lake Michigan Conference held - November 2001 • Forum/Grand Valley State University "Making Lake Michigan Great Tour" continues to educate about Lake Michigan ecosystem during summer cruises • Great Lakes Strategy released in 2002 by U.S. EPA • Great Lakes Human Health Network established • Voluntary monitoring Conference March 2002 • Wingspread Accord signed • Participation by regional councils in watershed planning and water supply conferences **2004** • Watershed Academy training held and 6 regional conferences held or planned • Indiana Coastal Zone program gives out first grants • Illinois Conservation Congress recommends investigation of CZM participation • Great Lakes Cities Initiative launched • Illinois Ecosystem Partnership for Lake Michigan in development • Waukegan recognized as an EPA Environmental Justice community • Great Lakes restoration bill introduced into Congress • EPA utilizes watershed focus • Mona Lake Watershed Stewardship Assessment completed • Illinois-Indiana-Wisconsin planning agencies agree to consistent groundwater planning **2006** • **President signs Executive Order organizing Great Lakes Regional Collaboration** • **Great Lakes Regional Collaboration sees participation by numerous organizations and releases report and recommendation in December 2005** • **Regional planning agencies follow-up on Phase II Watershed Academy activities** • **Lake Michigan Forum performs watershed assessment for Baird Creek** • **NIRPC releases Water Conservation and Protection Toolkit** • **NIPC releases 2040 regional framework plan with tools for decisionmakers** • **Michigan and Indiana Cooperate in Developing the St. Joseph River Watershed Management Plan** • **Great Lakes governors and Premiers sign Great Lakes Charter Annex Implementation Agreements**	• Develop projects utilizing the Lake Michigan LaMP watershed fact sheets and exploration of other needed tools (see Appendix D) • Continue the Lake Michigan Watershed Academy and support GIS and models workshops and small implementation grants to local communities • Provide additional education and outreach materials on water conservation and source water protection • Promote the habitat and land use management tool box • On-line habitat atlas continues to build layers • Hold FY 2007 State of Lake Michigan Conference • Continue the research vessel boat tour – Making Lake Michigan Great • Continue the development and linkage of local watersheds with basin-wide issues and activities through the watershed academy • Coordination of LaMP and GLBTS efforts on PCBs and mercury • LMMCC continues leadership role for collaborative monitoring in 2010 • Meet with the four Coastal Management programs to explore partnership opportunities	• Clean up and delist AOCs • Implement the Lake Michigan Watershed Academy • By 2020, every watershed will be represented and in communication with other watershed groups around the basin • By 2020, watershed literacy will be rated high

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Research and Monitoring Actions that monitor the ecosystem, reduce uncertainty, and inform our decisions SOLEC Indicator Bundles ▪ Proposed new "Well-Being" bundle	**Subgoal 11** We have enough information/data/understanding/ indicators to inform the decision-making process ***Status*** • Mixed in 2004 • Mixed/Improving by 2010 • Sustainable by 2020	**2002** • LMMB project findings • Lake Michigan Monitoring Coordinating Council monitoring and assessment inventory • Lake Michigan Monitoring Assessment report released • Beach monitoring program (BEACH) created by U.S. EPA • BEC statement and monitoring conference • IJC/Delta Institute/Lake Michigan Forum Air Deposition Workshop • Great Lakes Wetlands Consortium consolidates wetland information • EPA/ORD wetlands indicators • LaMP pollutant list review • Beach Conference, web site, and manager's group **2004** • National Park Service monitoring begins • Lake Michigan Monitoring Council develops 2005 intensive monitoring year plan • Midwest Spatial Information Partnership formed - Workshop held in conjunction with Lake Michigan Watershed Academy • LMMB data sets available • Ann Arbor Statement on long-range atmospheric transport proposed **2006** • **USGS maintains surface water-quality network for streams in the Lake Michigan basin** • **GLNPO's Aquatic Contaminant Monitoring program completes FY 05 Intensive Year of Monitoring** • **First collaborative Lake Michigan basin-wide FY 05 Year of Intensive Monitoring completed**	• Monitoring and research will be reviewed to identify LaMP pollutants and trends to determine if LaMP pollutants list needs to be changed • A LMMB Study data report completed for each contaminant studied and added to the LaMP online at www.epa.gov/GLNPO/LMMB • Progress will be made in aligning monitoring programs and indicators • The coordinated monitoring results for the lake intensive monitoring year 2005 will be completed, analyzed, and published • Lake Michigan models will be documented further, and additional scenarios will be simulated with results shared through the LaMP and in other ways • Complete Lake Michigan Monitoring Coordinating Council Aquatic Nuisance Species monitoring survey results and recommendations. • Cladophora alga research and development is being supported by the LaMP	• Special effort and emphasis on coordinated monitoring in the Lakes Michigan basin by 2004-05 • By 2010, complete next collaborative monitoring effort • By 2015, complete 20 year revisit of Lake Michigan Mass Balance